MEMORANDUM

Transportation Engineering Program

To: **Tiffany Antol, Development Planning Manager**

From: **Jeff Bauman, Traffic Engineer**

Date: **August 22, 2014**

RE: **Acceptance with Conditions**
Traffic Impact Analysis sealed 07/23/2014 and Traffic Signal Warrant Analysis dated August 2014

The Transportation Engineering Program has reviewed the submitted Traffic Impact Analysis (TIA) and Traffic Signal Warrant Analysis. ADOT has submitted comments/conditions under separate cover, dated 08/21/2014 and attached to this memo. This memo documents City Transportation Engineering's review and **Conditions of Approval** for the TIA and the Traffic Signal Warrant Analysis for Aspen Heights Student Residences:

1. Vehicular and Pedestrian cross access **shall** be provided between the residential land use and the commercial land use. The Applicant can decide the location of the cross access, but the access does need to be provided with future site planning submittals. No TIA analysis needs to be redone.
2. The Signal Warrant Analysis for the intersection of Route 66 and Woody Mountain is not approved, but ADOT's review conditions are attached and the re-submittal of the warrant analysis is not expected to change the proportional share analysis attached, nor recommend that a signal be installed upon project opening. Under those two qualifying statements, the following Condition of Approval #3 is valid. If either of these two qualifying conditions change, the following condition will need to be re-evaluated.
3. Future ROW needs and proportional share for the intersection of Route 66 and Woody Mountain are required. A planning level signal layout should be provided with construction plans to help determine the ROW dedication requirements. The developer's proportional share contribution for this future signal need is documented in the attached table. The planning level estimate for a future traffic signal in the Flagstaff Region is $400,000. The calculated proportional share based on percent project traffic in the intersection of Woody Mountain Road and Route 66 is 25.7%, or $102,805. The timing of this proportional share contribution shall be outlined in the Development Agreement.

If you have any questions, or would like to schedule a time to discuss these comments further please contact me.

Aspen Heights - Route 66 & Woody Mountain Proportional Share

	Current	*2015 Background w/o Project*	*2015 w/ Project*	*Source*	*Total Project Trips*	*Total Project Trips ÷ 2015 w/ Project*	***Proportional Share Cost***
AM	622	664	851	Counts in TIA	187	21.97%	$ 87,896.59
PM	617	660	931	Counts in TIA	271	29.11%	$ 116,433.94
Average	620	662	891	Averages	229	25.70%	$ 102,805.84

NOTE:

- The average cost of installing a new signal is approximately $400,000. This amount cost was assumed in the calculations.

ADOT

Northern Region Traffic Office

MEMORANDUM

TO: Warren Sutphen, Flagstaff Permits Office Supervisor

FROM: Cready Smith, Northern Region Traffic Transportation Engineering Specialist

DATE: Thursday, August 21, 2014

CC: Walter K Link, Northern Region Traffic Engineer

RE: Woody Mtn. and B40 signal analysis.

Northern Traffic Region office recommends that a resubmittal of the warrant analysis be submitted for review.

CivTech is to be commended for putting forth such a detailed signal warrant analysis – it is tricky and art mixed with science to analyze the need for a traffic signal in the future when numerous variables are at play. The Woody Mountain/Route 66 intersection is a "T" intersection and the location and type of proposed development will create predominate traffic movements in the form of left-in and right-out. These turning movements can often be completed safely and efficiently even when threshold warrant values are met. The proposed Aspen Heights development is a student housing project at an intermediate distance from campus: the trip generation rates are not supported by matching ITE generation rates verified through numerous studies. A reasonable attempt has been made to estimate these – however, substantial uncertainty remains both with the rates and distribution throughout the day. The commercial component of the development is also an estimate at this point in time as to the character. Given the type of turning movements combined with the opposing EB Route 66 traffic volumes it is unlikely the regional traffic office will recommend signalization after any revision to the analysis is completed. This decision is likely to hold even if warrant thresholds are met in any revised submittal; however, a final decision will be made at that time.

It is recommended the final study be utilized by the City of Flagstaff to determine a proportionate share of future intersection improvements in whatever form they may take.

1. Table 7 (page 15) note number 2, states the minor street approach volume represents all left-turning vehicles plus ½ of the right turning vehicles – it does not appear the reduction has occurred to the minor street right-turning vehicles. As discussed earlier, ADOT PGP 611 sets forth specific requirements regarding the percentage of right-turn

traffic that should be "counted" towards meeting the minor leg volume. Paraphrased from PGP 611, the ability of traffic to make right-turns on red may reduce the benefit realized from a traffic signal if one is installed. Therefore, the effect of right-turn vehicles from minor street approaches should be considered when volume warrants are applied. In order to adjust the right-turn volume, only vehicles that exhibit a stopped-delay in excess of 5 seconds should be considered in the minor street warrant volume. As the NB approach to Woody Mtn. is approximately 97% right-turning vehicles in the peak hours, this is an important consideration. It is common in the early stages of reviewing an intersection to utilize a 50% reduction to the right-turning volume from the minor street. Work completed by this office in the Flagstaff area on intersections with reasonably similar mainline volumes to the estimated build-out condition would indicate the percentage of right-turning traffic that exceeds 5 seconds of stopped-delay is 30-35% in the peak hours – falling considerably outside of the mainline peak hours.

2. Table 7 appears to utilize incorrect eight, fourth, and peak hour volumes in the warrant comparison. Please check.
3. Table 7. The analysis has chosen to utilize 2 lanes for the major street approach and 2 lanes for the minor street approach. The Warrant 2, Four-Hour vehicular volume (70% factor) minor street threshold of 80 does not seem correct – it would appear the minor street warrant is 106 obtained through formula.
4. Table 7. Please check – it appears from a revised Table 5 – the peak hour would be 764 and 237 rather than 751 and 237. The Warrant 3, Peak Hour volume (70% Factor) minor street threshold would be 228.
5. Conclusion first paragraph needs to be updated fully from previous report.
6. Hourly shopping center volumes have rounding errors.